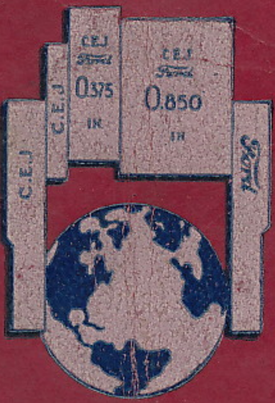
JOHANSSON
GAGE BLOCKS
AND
ACCESSORIES

CATALOG No. 12

Prices effective March 1, 1937

World's Standard of Measurement



MADE BY

FORD MOTOR COMPANY

JOHANSSON DIVISION

DEARBORN, MICHIGAN

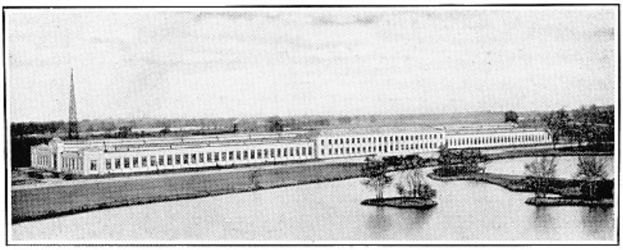
SALES DISTRIBUTOR

SWEDISH GAGE COMPANY OF AMERICA

7310 WOODWARD AVENUE

DETROIT, MICH.

WORLD'S STANDARD
OF
MEASUREMENT



The "American Home" of Johansson Gage Blocks
Engineering Laboratory
Ford Motor Company Dearborn, Michigan

Johansson Gage Blocks are the world's standard of precision measurement. They have no counterpart in science or in industry. They measure accurately in millionths of an inch—an accomplishment considered impossible before their introduction.

Precision that knows no parallel and virtually no limit is available on a thoroughly practical and economical basis for widely varied craftsmanship.

Although a number of methods have been developed to control measurement of length, these gage blocks have proved most practical and most dependable. Over ten thousand sets as well as thousands of individual gage blocks are already in use.

The prices listed in this catalogue are NET and are subject to change without notice.

A Tribute

The following article appears in Volume 31 of the 12th Edition of the Encyclopaedia Britannica.

THE decade 1910-20 saw a noteworthy development in every branch of machine-tool engineering. In no branch was the progress more marked than in instruments for precise measurements. These include types employing both physical and optical means. Their perfection has made possible the production of interchangeable parts in commercial quantities. Without means of accurate gauging the making of automobiles in great numbers would be impossible. This is also true of rifles, typewriters, sewing-machines and hundreds of other things made and used daily in great numbers. For accuracy and almost universal application, the gauge blocks shown on Plate 1, fig. 1, made by C. E. Johansson, Eskilstuna, Sweden, stand high. The first combination set on his system was made in 1897, but not until 1911 was Johansson able to produce them in commercial quantities of a guaranteed quality. Subsequently these blocks became so recognized as standard that there is hardly a manufacturing plant in the world doing accurate or interchangeable metal work that has not one or more sets for reference purposes or actual use. They are also in constant use at the National Physical Laboratory, London; the National Bureau of Standards, Washington; the Bureau International des Poids et Mesures, Paris, and similar institutions of all the principal nations.

A full set consists of 81 blocks with surfaces flat and parallel within one hundred-thousandth of an inch. A standard set is made up of four series. The first series consists of nine blocks, the first 0.1001 in. wide, increasing by 0.0001 in. each to the ninth 0.1009 in. wide. The second series consists of 49 blocks, the first 0.101 in. wide, increasing by 0.001 in. each to the 49th, 0.149 in. wide. The third series consists of 19 blocks from 0.050 in. to 0.950 in. wide, each increasing by 0.050 in. The fourth series consists of four blocks, 1, 2, 3 and 4 in. wide respectively.

These blocks may be stacked or "wrung" together to form an enormous number of very accurate "blocks" practically equal to a similar solid block. For instance, the blocks of the fourth series can be combined to give any size in even inches from one to ten.

The blocks of the third series can be combined with those of the fourth so as to give any even multiple of 0.050 between 0.050 and 10 in.

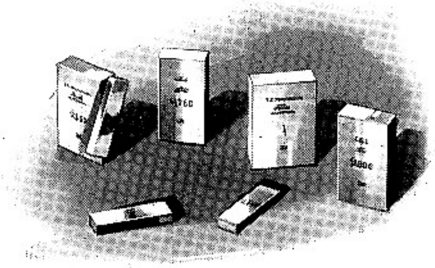
The second series furnishes means of stacking the gauges to obtain dimensions varying by thousandths and the first series gives variations by ten-thousandths of an inch. One stack of all the blocks wrung together gives accurate results.

That these blocks are held together by far more than atmospheric pressure is proven by a demonstration given Nov. 10, 1917, before the Stockholm Technical Institute. Two blocks were wrung together, the sizes of the two surfaces in contact were 0.49 sq. in. and they sustained a weight of 220 lbs. The atmospheric pressure contributed about 6.6 lbs., from which it will be seen that the adhesive power of the blocks was more than 30 times atmospheric pressure. In spite of this extraordinary adhesive power the blocks are easily separated by a simple sliding movement, and they are as easily "wrung" together in the same way if the surfaces are first wiped with the hand. The great advantage given by these blocks is that they furnish a practically universal standard of gauging, since parts, gauges, templets or tools, made in England and checked with reference to them, will check the same with a set in America, France or Japan. The composition of these gauging blocks is such that they are long-wearing and little affected by ordinary changes in temperature.

100 Lbs.
100 Lbs.

What Are Johansson Gage Blocks?

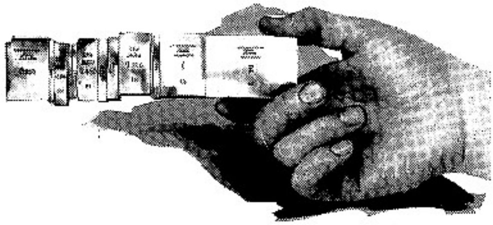
The JOHANSSON GAGE BLOCKS are rectangular pieces of tool steel, approximately 3/8″ by 1 3/8″ by specified size, hardened, ground, stabilized, and finished to an accuracy within a few millionths of an inch from specified size.



The JOHANSSON GAGE BLOCKS embody in their commercial manufacture the solving of four universally recognized metallurgical and mechanical problems, namely:

FIRST:—FLAT SURFACES IN STEEL.
SECOND:—PARALLEL SURFACES IN STEEL.
THIRD:—ACCURACY AS TO DIMENSIONS IN STEEL.
FOURTH:—EFFECTIVE SEASONING OF STEEL.

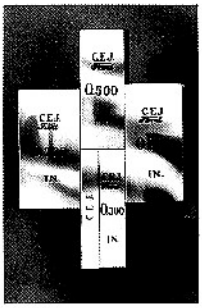
FLAT SURFACES IN STEEL. It is considered one of the most remarkable achievements in mechanics to make a flat surface in steel, and, by the JOHANSSON methods, a flat surface, with an extremely high finish, having the appearance of burnished silver is produced, which approaches nearer the perfect plane than any other surface produced by the hand of man. These flat-lapped surfaces when thoroughly



Combination of
JOHANSSON GAGE BLOCKS
showing adhesive qualities

cleaned and slid one on the other with a slight inward pressure, will take hold as though magnetized. "Atmospheric pressure," "molecular attraction," and "a minute film of oil on the lapped surfaces," have been offered as an explanation of this phenomena. Possibly it is a combination of all three.

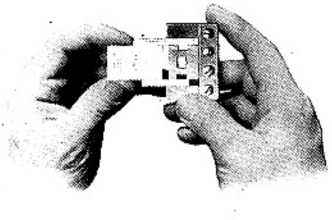
Parallel Surfaces in Steel—The degree of parallelism attained in the manufacture of the Johansson Gage Blocks is well shown by the fact that any block in a given combination may be turned end-for-end at will without affecting either the size or the parallelism of the two extreme surfaces of the combination.



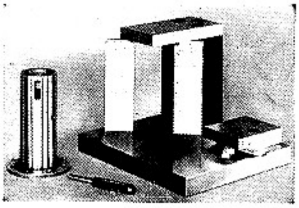
A combination of two blocks checking against one block

Accuracy—The making of one steel surface parallel with another is a recognized problem, but to make the parallel surface a predetermined distance from another surface and with an accuracy in millionths of an inch, is a most remarkable achievement. That this has been accomplished is proven by the way in which equivalent size combinations of Johansson Gage Blocks check against each other.

Effective Seasoning—The Johansson Gage Blocks are so seasoned by Johansson methods that internal stresses and strains are relieved. The molecules of the steel may be said to be at rest and because of this, the usual warping or growing is checked.



Checking special gage with gage blocks



Certifying the Go and No Go size on special gage with gage blocks.

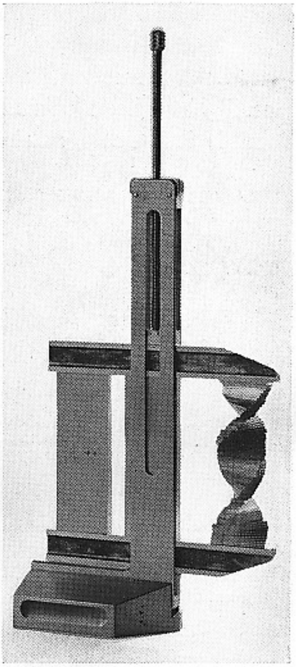
ACCURACY

The JOHANSSON GAGE BLOCKS are made in "B," "A" and "AA" quality having an accuracy at 68° Fahrenheit of

QUALITY	INCH	METRIC
"B"	±.000008	.0002
"A"	±.000004	.0001
"AA"	±.000002	.00005

per block up to one inch (25.4 mm.) of length and per inch (25.4 mm.) of length on longer blocks.

NOTE: "B" quality gage blocks may have very minute scratches on the gaging surfaces but these do not impair the measuring value.



Gage Block Identification Marks

"B" quality Gage Blocks have no letter etched on the face or marked side. Fig. (1).

"A" quality Gage Blocks have a letter "A" etched on the face. Fig. (2).

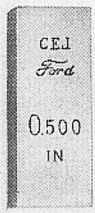


Fig. 1

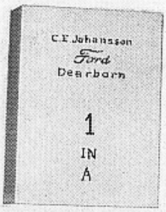


Fig. 2

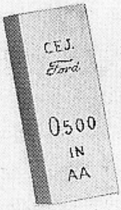


Fig. 3

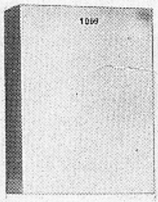


Fig. 4

"AA" quality Gage Blocks have the letters "AA" etched on the face. Fig. (3).

All sets of Gage Blocks have a serial number etched on the bottom of the Blocks as they lie in the case. Fig. (4).

THE STANDARD SETS

GAGING SYSTEM
SET NO. 1

Consists of 81 Blocks

They will make 120,000 different size gages, in steps of .0001 inch, from minimum size .200 inch to more than 12 inches.

1st: One Ten-Thousandth Series—9 Blocks

.1001″ .1002″ .1003″ .1004″ .1005″ .1006″ .1007″ .1008″ .1009″

2nd: One Thousand Series—49 Blocks

.101″ .102″ .103″ .104″ .105″ .106″ .107″ .108″ .109″ .110″
.111″ .112″ .113″ .114″ .115″ .116″ .117″ .118″ .119″ .120″
.121″ .122″ .123″ .124″ .125″ .126″ .127″ .128″ .129″ .130″
.131″ .132″ .133″ .134″ .135″ .136″ .137″ .138″ .139″ .140″
.141″ .142″ .143″ .144″ .145″ .146″ .147″ .148″ .149″

3rd: Fifty Thousand Series—19 Blocks

.050″ .100″ .150″ .200″ .250″ .300″ .350″ .400″ .450″ .500″
.550″ .600″ .650″ .700″ .750″ .800″ .850″ .900″ .950″

4th: Inch Series—4 Blocks

1.000″ 2.000″ 3.000″ 4.000″

Working Set No. 1-B in a Case	$ 295.00
Inspection Set No. 1-A in a Case	395.00
Laboratory Set No. 1-AA in a Case	1,745.00

For display purposes, this combination of 81 gage blocks can be furnished, at prices shown above, in a beveled plate glass top walnut case.